



# What Utility Executives Can Do Now

## Eight steps to enhance utility energy efficiency programs

By Mike Mernick, Patty Cook, David Pickles, and Steve Fine

### Let's not talk about the future

We prepare for the future, but we don't live it. We live—and must act—in the present. Sounds obvious. But it's easy to forget when you work in energy, a field that (for good reason) spends a great deal of time thinking ahead. Many utilities create resource plans for a decade or longer. They analyze future population growth, technology, resources, regulation, and pricing. Such forecasting is crucial to achieve societal goals, such as carbon reduction, while ensuring that utilities fulfill their threshold, legal obligation: the delivery of safe, reliable, and affordable power.

But isn't it actually today's programs that lead to the programs you will have in your portfolio tomorrow? Would you ever throw out all of the programs you currently offer to your customers so that you can start over from scratch? No, of course not. So for the moment, let's put down the crystal ball. Let's stop peering into the future and instead ground ourselves in the present and consider what utilities can do now to improve their energy efficiency portfolios and preserve and strengthen customer relations. What immediate steps should they take? How can they leverage existing programs and already-collected data?

This paper lays out eight practical steps that utilities can take now to build the case for innovation while preserving their base of effective programs. But first, it's important to explain why utilities find these steps difficult.

## Daunting landscape

At this moment in history, the utility industry faces pressures not known to it before.

New technology and software are proliferating, disrupting and revolutionizing business models and reconfiguring the balance between demand and supply-side resources. Grid planners seek to integrate these resources while simultaneously modernizing the grid to provide reliable, resilient, clean, and affordable power... and demand side management programs are ground zero for this convergence.

Consider, for example, how the very concept of 'energy efficiency' is changing.

With the rise of distributed energy, the line blurs between energy use and energy production, between energy savings and energy supply. For instance, battery storage and electric vehicles create new demand for electrons on the one hand, and on the other supply electrons in the sense that they're able to inject what they've stored onto the grid.

In their dual role, these technologies become tools for sophisticated energy management, elevating efficiency beyond simple light-bulb style savings. Efficiency becomes about producing and consuming energy at exactly the right time and place to lower system costs, avoid congestion, or correct duck-like load curves.

## New opportunities

As a result, new leverage points arise for energy efficiency on the grid. In some cases, state policymakers are encouraging these opportunities. Massachusetts, for example, now has a clean peak standard, a program that mimics a renewable portfolio standard, but requires delivery of resources during the hours of highest cost and emissions. Where and when becomes as important as how much.

Today's grid also offers more opportunities for energy efficiency, demand response, and distributed energy to supplant conventional energy infrastructure. More than 20 states now require that utilities consider non-wires alternatives before investing in new infrastructure. New York's Brooklyn-Queens Demand Management program often is cited as a prototype because it deferred a \$1.2 billion substation upgrade by instead employing 17 MW of distributed energy and 52 MW of demand reductions, achieving significant savings along the way.

## Customers as the grid

The line is blurring not only between energy use and production, but also between consumer and producer. As a result, the utility-customer relationship is transforming.



Customers are taking a more active role in energy production as they install solar panels and other forms of distributed energy in their homes and businesses. This has given rise to the term ‘prosumer,’ who is now essentially a supplier of services to the utility.

Some utilities view the prosumer as a threat; others see opportunity and seek ways to encourage customer engagement. We see the customer as a grid resource; you might even say the customer and the grid are becoming one in their influence.

In California, PG&E’s home energy optimization program offers an example of how this works. The program allows customers to choose their own smart devices, such as Wi-Fi thermostats and smartphone-activated water heaters, so that they can save energy at the right time. For the customer this brings cost savings. For the grid, it changes the role that customers can play in managing the grid when costs to generate and deliver energy are high. For example, through a program designed by ICF, PG&E will be able to determine normalized metered energy consumption values (NMEC). An otherwise difficult metric to capture, NMEC reveals how much energy a building would have consumed had energy efficiency measures not been employed. The metric helps the utility set a real-world baseline and allows targeting of energy management opportunities to ensure that energy efficiency shows up at the right time, in the right place.

## Threat to foundational programs

So in this new landscape, sophisticated use of technology opens opportunities for utilities to grow their energy savings programs, as well as expand the value proposition of demand side management. But at the same time, utilities face the threat of programmatic shrinkage as regulators pressure them to re-evaluate cost-effectiveness in the context of a potentially new value system.

Several states are scrutinizing their foundational or legacy energy efficiency programs that are considered by some to be too expensive — such as those for low-income customers, multi-family housing, and small- to medium-sized businesses. Some programs will end because they did not work; the investment did not achieve adequate energy savings. Others will end because they worked well. They rendered incentives unnecessary by achieving their goals; they transformed the market, drove down technology costs, or evoked permanent change in human behavior.

## So what to do?

With so much change and pressure, how can a utility even begin to see a way forward in today’s somewhat murky and unsettled technology landscape? How can it capture opportunities available now and position itself for the future? After working with utilities across North America for several decades, ICF has identified eight crucial steps.



## Eight steps to enhance utility energy efficiency programs

### Step 1. Consider influences

Your portfolio doesn't exist in a vacuum. External influences help shape its success. Chief among them are regulatory oversight and policy goals. How would you define your regulatory culture? Are your regulators and policymakers pushing for change, or are they content with the status quo? How does that affect your preferred rate of change?

You'll want to understand not only current regulation and targets, but what's on the drawing board. Are state incentives being considered that could enhance programs for your customers?

Does your state seem likely to revise targets or requirements for energy efficiency, renewables, or greenhouse gases? What's the political climate—is an election expected to bring about a significant change in governance? Examine not only government but also ISO/RTO policy. Understand their rules for energy efficiency and other distributed energy resources (DERs). To date, 19 states are considering how to modernize their infrastructure to better integrate these resources. Base load plant retirements will continue as the costs of new technologies decline—creating yet more pressure on traditional cost-effectiveness metrics. How will the continued proliferation of DERs impact how utilities plan, procure, and manage customer-sited resources? Can demand side management programs evolve to help utilities better manage these resources to benefit customers and improve the reliability and resiliency of the grid? Can these resources play in the wholesale markets, and how might that change in the future?

It's also important to stay alert to the development of codes and standards for building design and for energy-saving appliances, distributed generators, and other equipment. Of particular concern is equipment compatibility. Choosing non-standard technology for use in your programs can add cost and installation headaches.

### Step 2. Know what's new

Innovation is occurring as it never has before in the energy industry. So it's important that you understand what's possible with respect to new technologies, rates of customer adoption, and programs offered by other utilities. Even if you prefer a low-risk, wait-and-see approach, track what the bellwethers are doing. And if you're in the market for new programs, determine what combination might best serve your system and your customers. The choices are many: non-wires alternatives, virtual power plants, pay-for-performance contracts, new rate design, behavioral programs, strategic energy management, smart homes, electric vehicles, building electrification...



### Step 3. Treat data as king

By 2020, 1.7 MB of data will be created every second for every person on Earth, according to one estimate.<sup>1</sup> Smart meters, sensors, and other distributed devices contribute to the rich repository of information.

As utilities consider pilots or full-fledged programs, the proliferation of customer and grid data and analytics can yield important information on what customers want and how these “suppliers’” wants/needs can align to grid needs, to the benefit of all customers. Such was the case with one of our utility partners.

With ICF’s help, the utility is bringing data to the fore that it collects from its distributed energy resource management system (DERMS). The system allows the utility to see, in real time, the activity of devices throughout its network, right down to those in the home. And it is using that data to lower costs for customers.

Of course, as utilities collect data, they must be highly sensitive to consumer privacy, making it a key priority in the endeavor.

### Step 4. Evaluate

Once you understand the context and the possibilities, it’s time to evaluate what you have. That may sound obvious, but the energy world is full of shiny new toys, and it’s tempting for utilities to switch to something new in the name of innovation without first evaluating what they already do.

Fully assess your current energy efficiency portfolio. You might start by categorizing your programs by their stages of evolution. Are they foundational, transforming, or non-traditional? A foundational program is based on traditional cost-effectiveness metrics. It might have existed for years, and it may still be effective, may no longer be effective, or may never have been effective. A transforming program may include pilots or other demonstrations to test new approaches—such as connected devices and price signals—to flexibly manage load aligned with grid needs. These pilots leverage customer data, including AMI, to target and generate locational and temporal benefits and may be enabled by technology control platforms. However, these pilots may still need time to scale and reach full potential. And a non-traditional pilot or program is one that values flexible resource management—including the management and control of customer-sided resources—and compensates DER providers (or program implementers) based on delivered kW and kWh savings.

### Step 5. Ask the hard questions

In the context of your regulatory framework and evolving customer expectations, are your energy efficiency programs doing what they should be doing? What programs have you struggled for years to make successful? Is it time to throw in the towel? Maybe the program is a victim of its own success. Perhaps an energy-efficient appliance has dropped so much in price that it no longer needs utility incentive support?



<sup>1</sup> <https://www.domo.com/solution/data-never-sleeps-6>

But if you choose to ramp down, or even eliminate, programs over the next one or two years, can you still reach your energy savings goals? You'll need to determine how to replace the program with one that will at least be equally effective in helping you reach your savings goals and business objectives.

It's also important to consider how the program influences your relationship with your customer. Even if it is not meeting energy savings goals, does the program provide other benefits? Perhaps it's particularly popular and generates goodwill. If the program is canceled, is there another way to maintain vital communication and engagement with your customers?

Finally, study your foundational programs for lessons learned. How can they inform and help scale your future portfolio?

### Step 6. Create an action plan

With all of this information in hand, you can formulate an action plan. At a minimum, it should include:

- Steps to phase out energy efficiency programs that are ineffective or no longer needed
- Objectives for new programs, including expanded demand side management that enables greater customer choice aligned with grid needs
- Timeline and steps to transition to new programs – without jeopardizing your energy savings goals
- Determination of the cost effectiveness of potential new programs, and evaluation of the relevance of new cost/benefit approaches being developed across the country
- Budget and potential for rate recovery

### Step 7. Implement pilots and demonstrations

It's best to go slow and test before fully committing to a program. Design a series of pilots or demonstrations to see what will work. Most commercial and industrial customers have participated in some level of energy efficiency programs over the last decade.

You've cultivated educated, aware customers. Can they lead the way in demonstrating new portfolio ideas such as the use of customer assets to maintain the reliability of the grid and improve resiliency? Gauge their willingness to participate and fast-track the programs that interest them.

State and federal departments sometimes offer funding for pilots and demonstrations, making them a relatively low-risk first step.

Finally, evaluate the results from pilots and demonstrations to form a long-term strategy.





### Step 8. Seek an experienced guide

You wouldn't consider undertaking a task as complex, difficult, and potentially dangerous as scaling Mount Everest without teaming up with an experienced Sherpa who knows every step of the journey ahead. Neither should you start off to refocus, refresh, and revitalize your portfolio of customer programs without an experienced partner to guide you. Many examples exist nationwide of successful programs like these. You may or may not adopt these models, but it's important to evaluate their successes and failures for what they foretell. This can be a difficult step to undertake alone. After all, you are focused on doing a good job in your own service territory, and it's not easy to find the time, resources, and staff to keep up with a myriad of models and technologies underway elsewhere.

A knowledgeable partner can help. ICF has advised North American utilities on portfolio design, delivery, and strategy, and so brings a breadth of proven ideas and solid quantitative analysis to your portfolio. We know utilities, their customers, vendors, stakeholders, and regulators.

We provide counseling, portfolio assessments, and pilot/demonstration development to:

- Help find more value or redefine the value of utility portfolios
- Determine program pacing and how to accommodate a utility's preferred rate of change
- Educate decision makers about innovations and options
- Design the preferred mix of programs for a given utility's circumstances and customers
- Help the utility prepare internal constituents, regulators, and other stakeholders to share in the new vision

### Conclusion

The time has come for utilities to reassess, rethink, and re-plan their energy efficiency programs. Ultimately, it's about making the case for innovation while also leveraging what's worked: building the case and preserving the base.

Change is afoot and it's not easy to discern what the industry will look like in a decade or even five years. But one thing is clear: The way forward starts with action now.

*Time to refresh your energy efficiency portfolio? Contact us to start a conversation.*

## About the Authors



**Mike Mernick** is a Senior Vice President at ICF with over 30 years of experience in the energy industry. He currently leads the Market Development & Partnerships function for ICF's Commercial Energy business and has previously served as Director of ICF's Energy Efficiency division. During his early years at ICF, Mike was Senior Manager for ICF's support to the U.S. EPA's ENERGY STAR® Residential, Product Labeling, and Commercial and Industrial Programs. He also has been the Program Manager for the EPA's Clean Energy Initiative and the Senior Manager for ICF's support to numerous regional, state, and utility clients. Mike was a founding member of the Board of Directors for the Midwest Energy Efficiency Alliance (MEEA) and serves in an advisory capacity to the Northeast Energy Efficiency Council. He serves on the Policy Committee for the Alliance to Save Energy. He is Past-President of the Northeast Chapter of the Association of Energy Service Professionals (AESP) and has served four terms on the AESP Board of Directors. Before joining ICF, Mike worked as a Program Manager with the United States Department of Energy, where he was responsible for all statutorily mandated energy assistance programs within several Region One states. He holds an M.P.A. in Business Administration and a B.S. in Geography and Marine Affairs.



**Patty Cook** is a Senior Vice President with ICF's Commercial Energy practice. As a strategic leader with over 25 years of experience in energy, environmental policy, and management consulting, she helps clients realize opportunities to drive growth and innovation. Patty leads ICF's client initiatives related to the "utility of the future" to inform and enable the transformation to a customer-centric 21<sup>st</sup> Century grid. Her role in redefining integrated DSM helps clients navigate the transformation being shaped by customer preferences and behaviors, regulatory policy and the rapid proliferation of technology. She advises clients on the development of alternative business models and revenue streams, integrated distribution planning and strategy, financial models for the analysis of non-wires alternatives portfolios and innovative demand management through the deployment of customer-sided assets, smart home technologies and control platforms.

Patty has a Bachelor of Science in Conservation of Natural Resources from UC Berkeley and an executive certificate in Strategy and Innovation from the MIT Sloan School of Management.





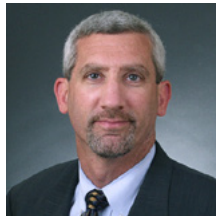


**David Pickles** joined ICF in 2004, and currently leads strategy and sales for ICF's Commercial Energy business. David has almost 30 years of experience in utility resource planning, energy efficiency and demand-side management, non-traditional product and service development, and operations of unregulated utility subsidiaries.

He previously held leadership roles at Navigant Consulting (Director of Market Strategy), PHI Consulting/Honeywell (CTO of the energy information business), CSW (now AEP, Vice President of Marketing, Development, and Operations of the energy services business), and Synergic Resources Corporation (Director of Pricing and Product Development).

David is a previous board member of the North American Energy Standards Board and the Dallas Chapter of the Product Development and Management Association. He has testified as an expert witness on more than 25 occasions, and is a frequent presenter on utility energy efficiency programs and policies, innovative new business opportunities for utilities, regulation, and beneficial electrification.

David has a master's degree in public utility economics, and a bachelor's degree in economics, both from the University of Wyoming.



**Steve Fine** is a Vice President with ICF's Energy Advisory and Services practice, and leads the Distributed Energy Resources Team. Steve has expertise in evaluating the economics of conventional and renewable energy resources—both central station and distributed generation—within the context of developing technologies, market design and environmental

regulations. He works with many of the major US power companies and developers in evaluating the impact of distributed energy resources (DER) on their system and the implications for their business models and their distribution system planning and operations.

He has published numerous whitepapers on the Value of Solar and Distributed Resources and is actively working with the DER team to develop innovative analytical frameworks that can be used by utilities and third parties to more accurately assess the value of these resources in the context of system planning. Before joining ICF, he worked for Luz International Inc., at the time the largest manufacturer and developer of solar thermal power plants in the world.

Steve has an M.A. in Economics from the Johns Hopkins School of Advanced International Studies and a B.A. from the University of California, Santa Cruz.





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